

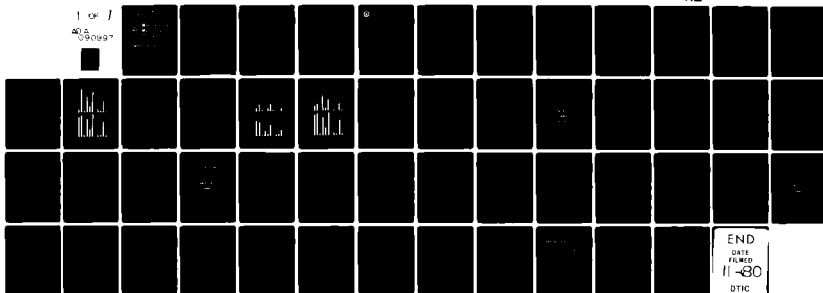
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ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY ROCK ISLAND IL F/G 13/8
MANUFACTURING METHODS AND TECHNOLOGY, CAM RELATED PROJECTS, FY --ETC(U)
AUG 80 J H SULLIVAN

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U.S. ARMY

MATERIEL DEVELOPMENT
AND READINESS COMMAND

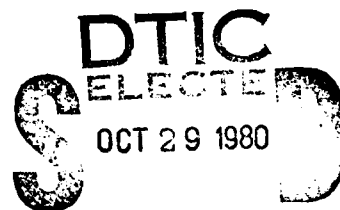
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LEVEL
MANUFACTURING
METHODS &
TECHNOLOGY

CAM RELATED PROJECTS

FY 80-82



A

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PREPARED BY

AUGUST 1980

USA INDUSTRIAL BASE ENGINEERING ACTIVITY

MANUFACTURING TECHNOLOGY DIVISION

ROCK ISLAND, ILLINOIS 61299

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- The projects listed and the dollar amounts shown are subject to change without notice.

None
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides a summary of the Army's FY 80-82 Manufacturing Methods and Technology Program directed toward computer-aided manufacturing. The following information is provided for 73 projects. Project number, title, projected funding, a statement of the problem and proposed solution, and the technology thrust area into which the project is categorized. The current status of FY80 projects is also provided.		

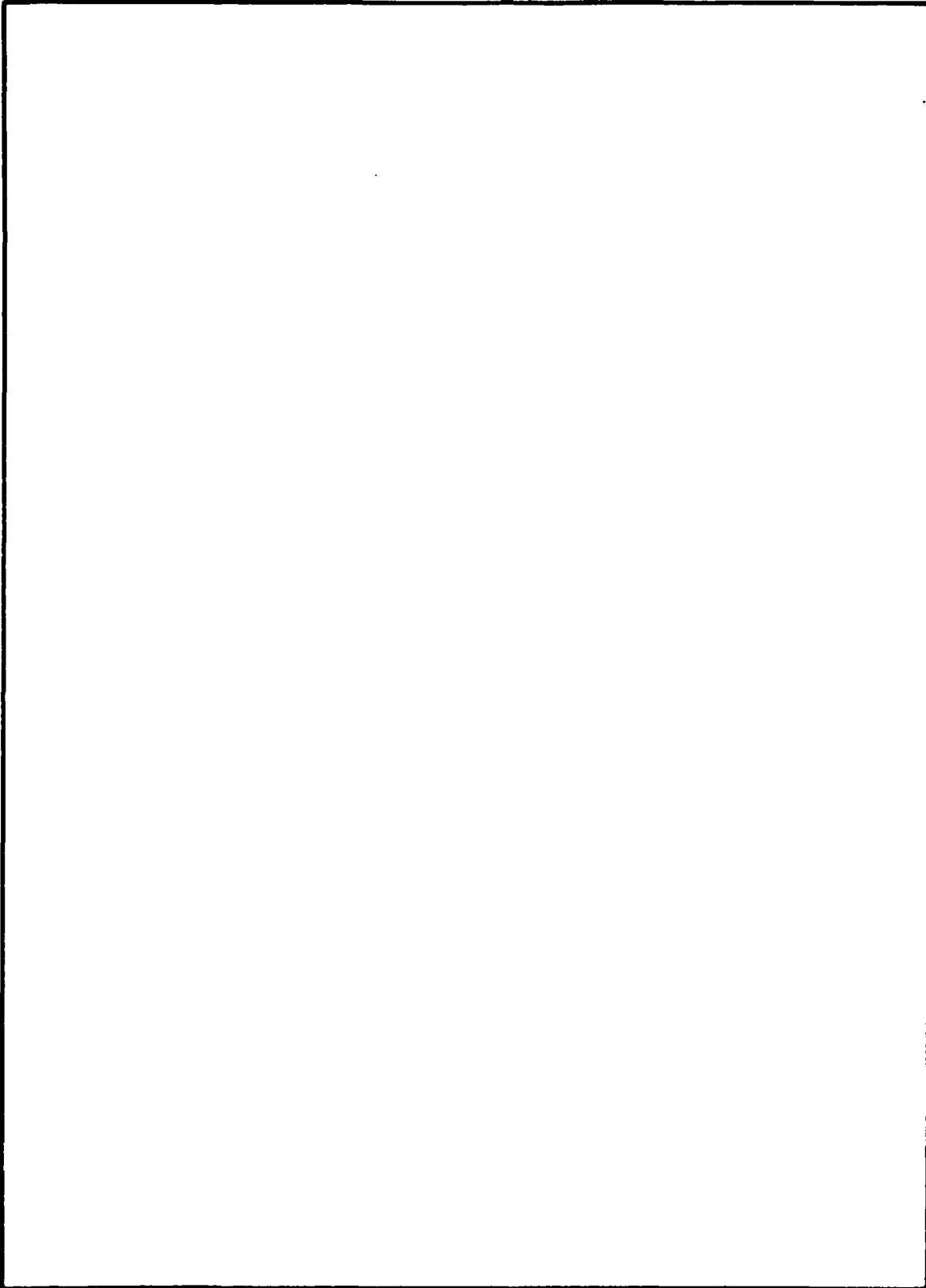
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DEPARTMENT OF THE ARMY
US ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY
ROCK ISLAND, ILLINOIS 61299

DRXIB

28 August 1980

SUBJECT: CAM Related Projects

SEE DISTRIBUTION

1. Inclosed for your information is a listing of CAM Related (MMT) Projects. This publication provides a comprehensive picture of where US Army Materiel Development and Readiness Command plans to invest MMT funds on CAM technology. Lists and summaries of the individual CAM related projects submitted by various DARCOM organizations are provided.

2. Questions regarding the contents of this report should be directed to Mr. Jim Sullivan, US Army Industrial Base Engineering Activity, Rock Island Arsenal, IL 61299; AV 793-6172, Commercial (309) 794-6172.

J R Gallagher

J. R. GALLAUGHER

Director

Industrial Base Engineering Activity

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B: Distribution List	B1

INDEX OF PROJECTS BY SUBORDINATE MAJOR SUBCOMMANDS

<u>Command</u>	<u>Project Number</u>	<u>Page</u>
ARRADCOM/ARRCOM		
Ammunition	5 80 3961	23
	5 80 4322	21
	5 82 4237	43
	5 81 6716	31
	5 80 6736	17
Weapons	6 82 7707	40
	6 81 7724	29
	6 81 7807	27
	6 80 7928	22
	6 81 7928	32
	6 80 7949	20
	6 80 7963	20
	6 80 8051	19
	6 81 8051	28
	6 81 8120	30
	6 81 8135	31
	6 82 8135	41
	6 81 8136	32
	6 81 8154	31
	6 82 8226	36
	6 82 8231	38
	6 82 8241	41
	6 82 8244	41
AVRADCOM	1 80 7183	19
	1 81 7183	27
	1 82 7345	40
	1 80 7371	22
	1 81 7371	32
	1 82 7371	42
CORADCOM	F 81 3005	28
	F 80 3036	19
	F 81 3036	28
	F 82 3036	37
	F 82 3069	42

<u>Command</u>	<u>Project Number</u>	<u>Page</u>
DESCOM	G 80 0001	18
MICOM	R 80 1018	18
	R 80 1021	20
	3 81 1021	29
	3 81 1060	33
	R 80 1071	17
	3 81 1071	25
	3 82 1072	38
	3 81 1073	33
	R 80 1075	17
	3 81 1075	25
	3 82 1075	35
	3 81 1076	33
	3 82 1076	43
	3 82 1079	40
	3 82 1092	43
	3 82 1095	36
	R 80 3169	22
	3 81 3281	30
	R 80 3445	21
	3 81 3445	30
ERADCOM	H 80 3010	21
	H 81 5006	25
	H 81 9845	26
NARADCOM	Q 82 8073	42
TARADCOM	T 82 5005	37
	T 82 5024	37
	T 80 5082	18
	T 81 5082	26
	T 82 5082	35
	T 81 5086	26
	T 81 5091	27
	T 82 5091	35
	T 82 6008	36
	T 82 6030	38
	T 82 6041	39
	T 81 6053	29
	T 82 6053	39
	T 82 6057-12	39

INTRODUCTION

This report contains a listing of the active FY80 and planned FY81-82 CAM related MMT projects. Data presented on each project includes the project number, title, projected funding, a statement of the problem and proposed solution, and the technology thrust area into which the project is coded. The current status of FY80 projects is also provided. Project information is presented in three sections, one for each fiscal year. Within each section, projects are grouped according to technology thrust areas. Descriptions of the technology thrust areas are included.

An analysis, summary, and an index relating projects to commands responsible for project execution are provided.

CAM TECHNOLOGY THRUST AREAS

To aid in analyzing MMT projects, each CAM related project is categorized into one of the following technology thrust areas. These thrust areas were originally identified in the Air Force's ICAM Program and were refined by the MTAG CAD/CAM Subcommittee.

Underlying the optimum benefits obtainable from utilizing CAM technology is the systems approach. Interrelationships between the various subsystems within an organization must be taken into consideration. These technology areas represent the "system" and direct thinking toward an integrated approach.

100 ARCHITECTURE

The purpose of the manufacturing architecture is to provide a clear understanding of the manufacturing environment and the interrelationships between subsystems that exist today. The manufacturing architecture, or framework, provides a common baseline in building integrated manufacturing systems.

200 FABRICATION

The fabrication technology area serves as a focus for all other technology area activities. Projects categorized into this area are directed toward increasing the productivity of manufacturing by systematically applying computer technology to all functions which directly and indirectly participate in fabricating parts.

300 DATA BASE/DATA AUTOMATION

Data base and data automation technology required to support integration of the many stages and disciplines of manufacturing.

400 CAD/CAM INTERACTION

The purpose of this technology thrust area is to establish subsystems and procedures which will integrate the efforts of product design and manufacturing. The underlying concept is that of a common data base between engineering and manufacturing and the application of computer graphics.

500 PLANNING AND GROUP TECHNOLOGY

Technology directed at optimizing process planning, production scheduling and control, factory layout and other tasks normally performed by indirect personnel that have a significant impact on manufacturing cost.

600 MANUFACTURING CONTROL

Generic technology for producing management oriented information tools for scheduling, monitoring and controlling operations within the manufacturing environment. Closely related to the fabrication and planning and group technology areas.

700 ASSEMBLY

The integration of computer aided technology into assembly operations.

800 SIMULATION, MODELING AND OPERATIONS RESEARCH

Soft technology for optimizing manufacturing systems through the application of operations research techniques.

900 MATERIALS HANDLING AND STORAGE

The integration of computer aided technology to aid in material handling. Objectives here include complying with OSHA and EPA standards and reducing costs and materials handling time through automated material storage, handling, and retrieval systems.

1000 TEST, INSPECTION AND EVALUATION

Develop and transition real time, computerized, nondestructive testing techniques for use in fabrication and assembly operations. Emphasis is put on automatic, in-process inspection and decision making without human intervention.

1100 CONTINUOUS FLOW PROCESSES

This technology area addresses the range of manufacturing processes that, for the most part, are continuous with minimum human interaction.

ANALYSIS

- Seventy-three CAM related Manufacturing Methods and Technology (MMT) projects are planned in this publication. The proposed funding and relative percent of the yearly MMT programs are:

<u>CAM Related Projects</u>	<u>Percent of Program</u>
FY 80 \$ 5.5 Million	8.5
FY 81 \$12.7 Million	18.2
FY 82 \$11.4 Million	10.2

- The projects are coded into one of eleven technology thrust areas. The thrust areas where planning is concentrated are:

(\$ Millions)				
<u>Technology Thrust Area</u>	<u>FY 80</u>	<u>FY 81</u>	<u>FY 82</u>	<u>Total</u>
Architecture	.7	3.5	1.0	5.2
Fabrication	1.5	3.3	1.4	6.2
CAD/CAM Interaction	.2	1.2	3.3	4.7
Manufacturing Control	1.8	2.4	2.5	6.7

The charts provided on page 8 depict a comparison between this year's plan (FY80-82) and the plan prepared a year ago for FY79-81. A significant increase in Architecture is noted and can be explained by the introduction of DOD's Electronics Computer Aided Manufacturing (ECAM) program.

- The DARCOM Subordinate Major Commands that have proposed the largest CAM programs for the three years combined are:

MICOM	\$10.6 Million
TARADCOM	\$ 6.5 Million
ARRADCOM/ARRCOM	\$ 6.1 Million
CORADCOM	\$ 2.3 Million
ERADCOM	\$ 2.2 Million
AVRADCOM	\$ 1.8 Million

TECHNOLOGY THRUST AREAS **ANALYSIS OF PREVIOUS PLANNING**

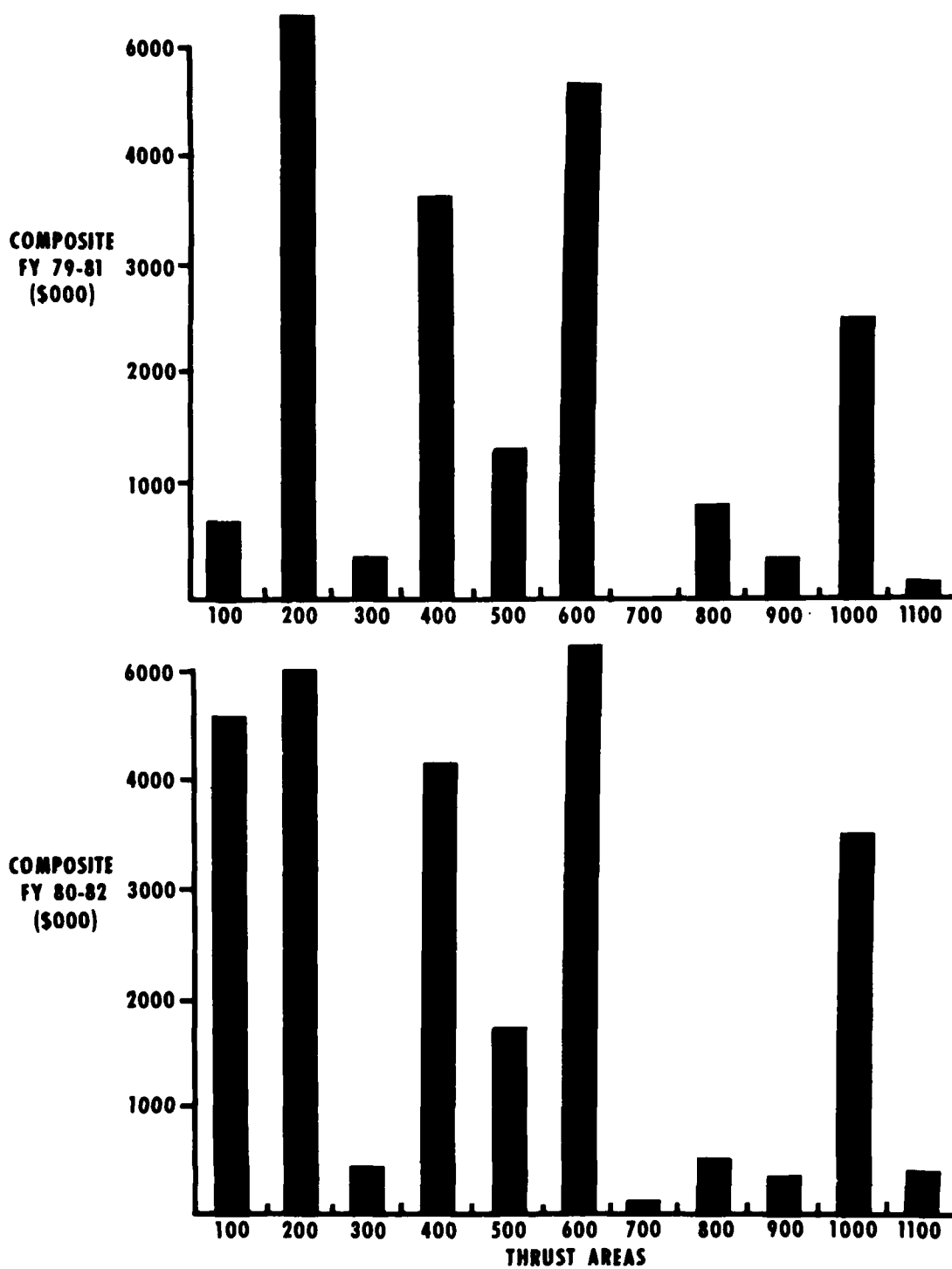


Chart 1: Comparison of distribution of funds across thrust areas, FY 79-81 vs FY 80-82.

SUMMARY

The tables and charts provided on the following six pages provide information relative to the distribution of funds across the CAM technology thrust areas. The first table provides a composite of planned funding. This information is then presented on bar charts. The following three tables identify the projected funding for each individual MMT project and the thrust area associated with the project.

TECHNOLOGY THRUST AREAS SUMMARY

FISCAL YEAR	THRUST AREA (\$000)											
	100	200	300	400	500	600	700	800	900	1000	1100	Total
80	715	1507	100	20	698	1807	113	-	-	542	-	5502
81	3500	3267	85	1125	474	2440	-	237	287	1332	-	12,747
82	1000	1430	205	3340	600	2543	-	286	-	1642	350	11,396
Total	5215	6204	390	4485	1772	6790	113	523	287	3516	350	29,645

This matrix provides a summary of the dollar values of CAM related projects relative to the technology thrust areas listed. The above data is depicted in bar charts on the following two pages.

TECHNOLOGY THRUST AREAS SUMMARY (CONT)

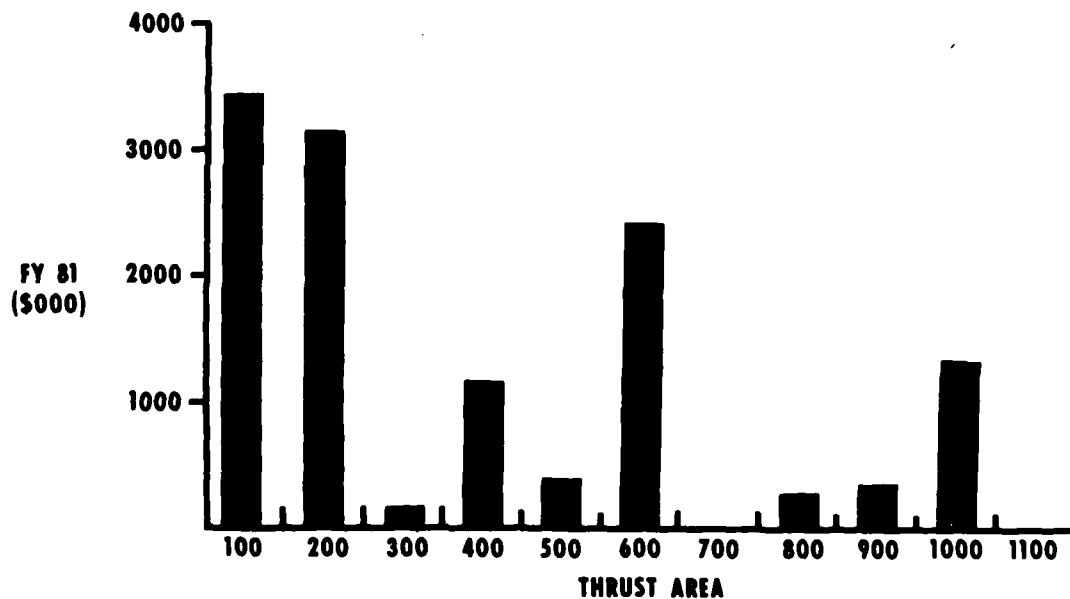
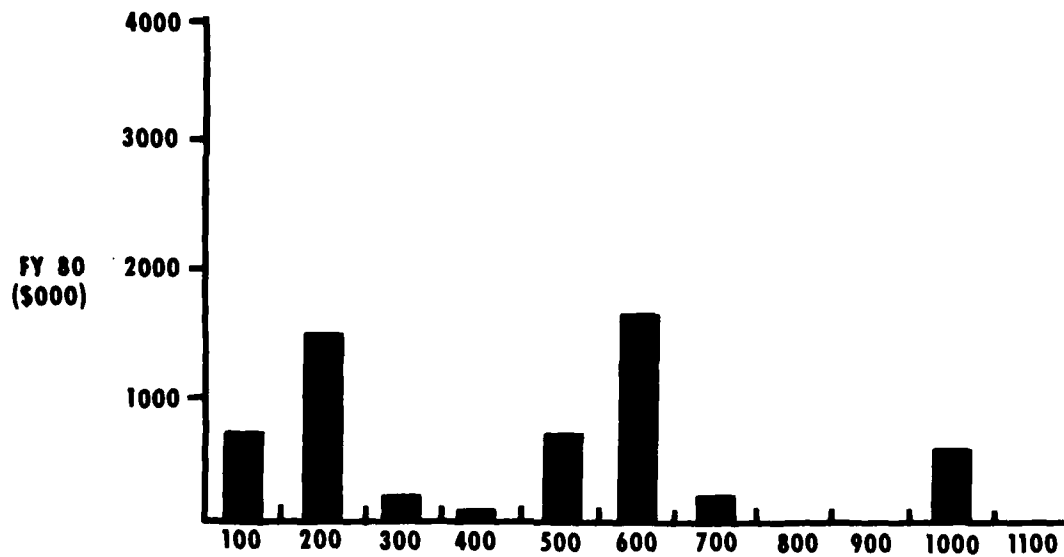


Chart 2: Distribution of funds across thrust areas.

TECHNOLOGY THRUST AREAS SUMMARY (CONT)

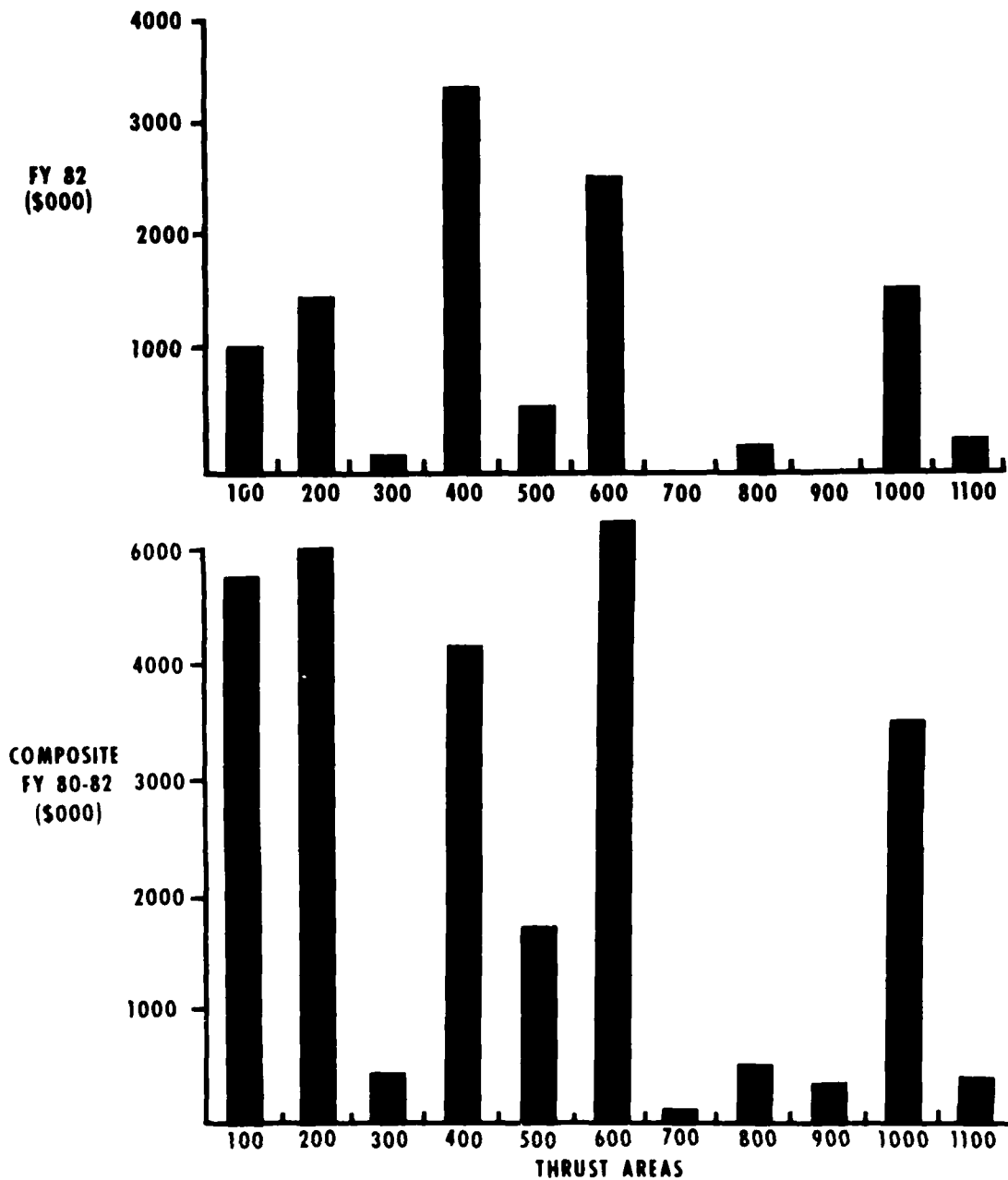


Chart 2 (cont.): Distribution of funds across thrust areas.

**TECHNOLOGY THRUST AREAS
PROJECT LISTING
FY 80 PROJECTS**

PROJECT	THRUST AREA (\$000)										
	100	200	300	400	500	600	700	800	900	1000	1100
F 80 3036				20							
G 80 0001		92									
H 80 3010						892					
R 80 1018 R 80 1021 R 80 1071 R 80 1075 R 80 3169 R 80 3445	100 300	380			240					90	
T 80 5082		880									
1 80 7371 1 80 7183		155								100	
5 80 3961 5 80 4322 5 80 6736	315					515				352	
6 80 7928 6 80 7949 6 80 7963 6 80 8051			100		155 303		113				
Total	715	1507	100	20	698	1807	113	-	-	542	-

This chart provides a listing of all the CAM related FY 80 projects. The dollar value of the project is provided in the appropriate thrust area column. Similar charts for FY 80 and FY 81 follow.

**TECHNOLOGY THRUST AREAS
PROJECT LISTING (CONT)
FY 81 PROJECTS**

PROJECT	THRUST AREA (\$000)										
	100	200	300	400	500	600	700	800	900	1000	1100
F 81 3005 F 81 3036				125 1000							
H 81 5006 H 81 9845		768 518									
T 81 5082 T 81 5086 T 81 5091 T 81 6053		880 255 420				350					
1 81 7371 1 81 7183		300								357	
3 81 1021 3 81 1060 3 81 1071 3 81 1073 3 81 1075 3 81 1076 3 81 3281 3 81 3445	1000 2500				250					375 200 400	
5 81 6716								157			
6 81 7724 6 81 7807 6 81 7928 6 81 8051 6 81 8120 6 81 8135 6 81 8136 6 81 8154		126	85		224	225 653 337			287 80		
Total	3500	3267	85	1125	474	2440	-	237	287	1332	-

TECHNOLOGY THRUST AREAS
PROJECT LISTING (CONT)
FY 82 PROJECTS

PROJECT	THRUST AREA (\$000)										
	100	200	300	400	500	600	700	800	900	1000	1100
F 82 3036 F 82 3069				1000						120	
Q 82 8073										218	
T 82 5005 T 82 5024 T 82 5082 T 82 5091 T 82 6008 T 82 6030 T 82 6041 T 82 6053 T 82 6057-12		750 180 250		300 640		300 500 500 300					
I 82 7345 I 82 7371						200				654	
3 82 1072 3 82 1075 3 82 1076 3 82 1079 3 82 1092 3 82 1095	1000			1200		350				400 250	
5 82 4237											350
6 82 7707 6 82 8135 6 82 8226 6 82 8231 6 82 8241 6 82 8244			205	200		133 557 303		286			
Total	1000	1430	205	3340	600	2543	-	286	-	1642	350

FISCAL YEAR

80

CAM RELATED

MM&T

PROJECTS

ARMY CAD/CAM PROJECTS
08/29/80

*** PROJ NUMBER TITLE PROJ COST

R 60 1071 HYBRID INTEGRATED CAD AND MANUFACTURING (MICADAM) 100

*** PROBLEM SOLUTION TECHNOLOGY AREA

HYBRID CIRCUIT DESIGN AND MANUFACTURE IS LAEOR IN ANALYZE FUNCTIONAL FLOW AND MANUFACTURING PROCESS
TENSIVE. THE CAD DATA BASE HAS NOT BEEN EXTENDED CONTROLS AND MODIFY THE DESIGN DATA BASE TO MAKE I
TO MANUFACTURING PROCESS CONTROL. T CAPABLE OF DEFINING FUNCTIONS, INPUT, OUTPUT, CO
NTROLS AND INTERFACES. USE ICAM METHODOLOGY TO DEV
ELOP SYSTEM ARCHITECTURE.

*** WORK STATUS

PROCUREMENT PACKAGE IS 75% COMPLETE. A CONTRACTOR WILL ESTABLISH AUTOMATED PROCEDURES FOR DESIGNING,
LAYING OUT, AND BUILDING HYBRID CIRCUITS. WILL USE IPAD AND ICAM METHODS AND TIE IN WITH CURRENT HY
BRID PROJECTS.

*** PROJ NUMBER TITLE PROJ COST

R 60 1075 ELECTRONICS COMPUTER AIDED MANUFACTURING (ECAM) 300

*** PROBLEM SOLUTION TECHNOLOGY AREA

ALTHOUGH INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRI DEVELOP A CAD MASTER PLAN FOR COMPUTER-AIDED DESIG
NED CIRCUITS AND CABLES ARE DESIGNED ON A COMPUT N AND MFG OF ELECTRONIC SYSTEMS. USE AIR FORCE'S I
PR. THERE IS LITTLE COMPUTERIZED CONTROL OF PROCE CAM AND NASA'S IPAD PROGRAMS TO DEFINE CAD/CAM AND
SSES USED TO PRODUCE THESE ITEMS. A MASTER PLAN I ELECTRONIC TECHNOLOGIES TO MAKE INTEGRATED CIRCU
S NEEDED TO DEFINE THE AREA AND REQUIREMENTS. TS, HYBRID CIRCUITS, PRINTED CIRCUITS, AND CABLES.

*** WORK STATUS

TECHNICAL REQUIREMENTS & EVALUATION CRITERIA WERE REVIEWED BY CAD-CAM-ELECTRONICS WORKING GROUP. COM
MENTS WERE INCORPORATED. CONTRACT SERVICES REVIEW BOARD IS CHECKING THE PACKAGE. CONTRACTOR WILL DEV
ELOP ARCHITECTURE FOR ECAM USING ICAM DEFINITION.

*** PROJ NUMBER TITLE PROJ COST

S 60 6736 TECH READINESS ACCEL THRU COMPUTER INTEGRATED MFG (CAM) 315

*** PROBLEM SOLUTION TECHNOLOGY AREA

THE LEAD TIME REQUIRED TO PRINC PRODUCTION LINES THE DEVELOPMENT AND IMPLEMENTATION OF A COMPUTER I
TO MOBILIZATION MAXIMUM IS INTOLERABLY EXCESSIVE. NTEGRATED MANUFACTURING SYSTEM WILL SIGNIFICANTLY
A CRITICAL DEFERENT IS THE EXTREME SHORTAGE OF REDUCE THE REQUIREMENT FOR HIGHLY SKILLED CRAFTSM
TOOLMAKERS AND MACHINISTS. N.

*** WORK STATUS

CONTRACT PACKAGES ARE BEING PROCESSED. PRELIMINARY PLANNING FOR TECHNOLOGY TRANSFER INTO AMMUNITION
MFG OPERATIONS WAS INITIATED.

ARMY CAD/CAM PROJECTS
04/25/80

*** *** * G 80 0001	TITLE VOICE CONTROLLED PROGRAMMING OF COMPUTERS	PROJ COST 92	TECHNOLOGY AREA FABRICATION CAD/CAM
PROBLEM	SOLUTION		
*** * PROGRAMMING COMPUTERS AND PROCESSING NC TAPES IS BEING DONE BY MANUAL INPUT WITH A KEYBOARD. THIS METHOD IS TIME CONSUMING AND SUBJECT TO ERRORS.	ESTABLISH A PROCESS OF INCORPORATING VOICE CONTROLLED PROGRAMMING EQUIPMENT IN THE PRESENT SYSTEMS. A NO DEVELOP PROGRAMS COMPATIBLE TO THE REQUIREMENTS OF THE EQUIPMENT.		
WORK STATUS			
*** * THIS PROJECT WAS JUST FUNDED. NO STATUS REPORT IS REQUIRED.			
*** *** * R 80 1018	TITLE IMPROVE MFG. PROCESSES FOR DRY TUNED ACCELEROMETERS (CAM)	PROJ COST 380	TECHNOLOGY AREA FABRICATION CAD/CAM
PROBLEM	SOLUTION		
*** * THERE IS A NEED TO ESTABLISH MANUFACTURING METHOD S NECESSARY TO INCREASE YIELD AND REDUCE COST OF DRY TUNED ACCELEROMETERS. THE PRESENT METHOD IS ABOUT 40% INTENSIVE AND PRONE TO ERROR.	ELECTRO-DISCHARGE MACHINING CAN BE ADAPTED TO AUTOMATED MACHINING OF THE COMPLEX DRY FLEXURE SUPPORTS. THIS APPROACH WILL PROVIDE THE FLEXIBILITY TO OPTIMIZE THE SUPPORT DESIGN FOR QUANTITY PRODUCTION		
WORK STATUS			
*** * THE CONTRACT HAS BEEN AWARDED AND AN UPDATED MILESTONE PLAN PREPARED. THIS EFFORT WILL DEVELOP IMPROVED MMT FOR THE PRODUCTION OF DRY TUNED ACCELEROMETERS.			
*** *** * T AC 5042	TITLE FLEXIBLE MACHINING SYSTEM, PILOT LINE FOR TCY COMPONENTS	PROJ COST 680	TECHNOLOGY AREA FABRICATION CAD/CAM
PROBLEM	SOLUTION		
*** * PARTS FOR TRACKED COMBAT VEHICLES ARE TYPICALLY NOT MANUFACTURED IN LARGE QUANTITIES. BECAUSE OF THIS, MASS PDN TECHNOLOGIES THAT RESULT IN LOWER PDN COSTS ARE NOT USED.	THE ADVANTAGES OF MASS PDN CAN BE REALIZED IN PRODUCING MEDIUM QUANTITY SIZE LOTS BY A CONCEPT KNOWN AS, FLEXIBLE MACHINING SYSTEMS. THIS PROJECT WILL ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO UTILIZE FMS FOR THE MFG OF ARMY MATERIEL.		
WORK STATUS			
*** * PHASE II IS CONTINUING THE ACTIVITIES INITIATED IN PHASE I TOWARDS PROVIDING GUIDANCE AND SOFTWARE SUPPORT IN SELECTING AND OPERATING A FMS. THE CONTRACTOR IS WORKING WITH HUGHES AIRCRAFT, AVCO, LYCOMING, G.F. PITTSFIELD AND ROCK ISLAND ARSENAL.			

ARMY CAD/CAM PROJECTS
04/29/80

PROJ NUMBER TITLE PROJ COST

* 1 80 7123 SEMI-AUTO COMPOSITE MANUFAC SYSTEM HELICOPTER SECONDARY STRU 155
PROBLEM SOLUTION

* HELICOPTER FUSELAGE STRUCTURES HAVE HIGH MANUFACTURING COST DUE TO HIGH PART COUNT AND HIGH ASSEMBLY COSTS. METHODS OF COMPOSITE FABRICATION HAVE BEEN INVESTIGATED BUT HAND OPERATIONS RESULT IN HIGH LABOR COSTS.
TECHNOLOGY AREA
FABRICATION CAD/CAM

WORK STATUS

* A CONTRACT WAS AWARDED TO HUGHES HELICOPTER. WORK INITIATION IS WAITING ON THE COMPLETION OF PORTION S OF THE FY79 PROJECT.

PROJ NUMBER TITLE PROJ COST

* 6 60 8051 APPLICATION AND CONTROL OF MACHINE TOOLS (CAM) 100
PROBLEM SOLUTION

* CURRENT PROCEDURES FOR THE JUSTIFICATION, SELECTION, APPLICATION, AND MAINTENANCE OF MACHINE TOOLS ARE INADEQUATE TO AVOID PROCUREMENT OF INEFFECTIVE, UNRELIABLE MACHINE TOOLS.
TECHNOLOGY AREA
DATA BASE/DATA AUTOMATION

WORK STATUS

* PROJECT REQUIREMENTS WERE DETAILED AND REVIEWED WITH PERSONNEL OF DIPEC, DRXIB AND ROCK ISLAND ARSENAL. VARIOUS PRIVATE COMPANY MAINTENANCE AND RELIABILITY EFFORTS WERE STUDIED. WRITING OF THE SOM BEG AN.

PROJ NUMBER TITLE PROJ COST

* F 80 3036 CAD/CAM OF SPECIAL ELECTRONIC CIRCUITS 20
PROBLEM SOLUTION

* SEMICONDUCTOR INTEGRATED CIRCUITS NEEDED FOR SPECIAL COMMUNICATIONS EQUIP. MUST BE CUSTOM DESIGNED FOR EACH NEW APPLICATION. EACH IC REQUIRES SEVERAL MASK SETS AND A NUMBER OF IC ARE REQUIRED FOR EACH DEVICE. CONSIDERABLE ARTWORK IS REQUIRED.
TECHNOLOGY AREA
CAD/CAM INTERACTION

WORK STATUS

* FUNDS WERE WITHDRAWN FROM THIS PROJECT AND APPLIED TO OTHER PROJECTS INCLUDING ECAM.

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE PROJ COST

R 60 1021 COMPUTORIZED PROD PROCESS PLAN F/MACHINED CYLINDRICAL PARTS 240

PROBLEM SOLUTION TECHNOLOGY AREA

PRESENT MANUAL METHOD FOR PRODUCTION PROCESS PLAN DEVELOP A COMPUTER SOFTWARE SYSTEM FOR PROCESS PLANNING OF MACHINED CYLINDRICAL METAL COMPONENTS ARE NING OF MACHINED CYLINDRICAL PARTS. THE SYSTEM WILL INADEQUATE DUE TO HIGH PROCESS PLANNING COSTS AND BE MANUFACTURER-INDEPENDENT AND WILL INCORPORATE A LACK OF STANDARDIZATION. PROCESS DECISION MODELING.

WORK STATUS

THE CONTRACT TO DEVELOP A COMPUTERIZED PROCESS PLANNING SYSTEM WAS AWARDED TO UTC. TECHNICAL MILESTONES HAVE BEEN FORMULATED.

PROJ NUMBER TITLE PROJ COST

6 80 7949 APPLICATION OF GROUP TECHNOLOGY TO RIA MFG (CAM) 155

PROBLEM SOLUTION TECHNOLOGY AREA

PRESENT PLANNING, SCHEDULING, AND MANUFACTURE OF WEAPON ASSEMBLIES AND COMPONENTS ARE BY SEPARATE LOTS AND PARTS WHICH REQUIRE MULTIPLE, MACHINING OPERATIONS, SET-UPS AND CHANGES OF TOOLING, AND CAUSE LOSS OF TIME AND MONEY.

WORK STATUS

THIS PROJECT IS A CONTINUATION OF 679 7949. THE MOST PROMISING GT APPLICATIONS AREAS WERE DEFINED AND SCHEDULED. INCLUDED ARE TASKS DIRECTED TOWARD PROCESS PLANNING AND EQUIPMENT REPLACEMENT. DEVELOPMENT OF A GROUP SCHEDULING SYSTEM IS UNDERWAY.

PROJ NUMBER TITLE PROJ COST

6 60 7963 GROUP TECHNOLOGY FOR FIRE CONTROL PARTS AND ASSEMBLIES 303

PROBLEM SOLUTION TECHNOLOGY AREA

FIRE CONTROL MANUFACTURING HAS RESULTED IN THE PROLIFERATION OF MANUFACTURING INFORMATION, LONG SET-UP TIMES OR MULTIPLE RESETS OF MACHINES, UNDERUTILIZATION OF MACHINES, LONG AND UNCERTAIN THROUGHPUT TIMES, AND HIGH WORK-IN PROGRESS.

WORK STATUS

UNDER PROJECT 679 7963 MICLASS VERSION 2.0 HAS BEEN IMPLEMENTED AND A PROCESS PLANNING MODULE IS BEING ACQUIRED. THIS PROJECT IS CONDUCTING ANALYSIS OF FIRE CONTROL SUB-ASSEMBLIES TO ESTABLISH GROUP TECHNOLOGY SYSTEM REQUIREMENTS.

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
80 3010	MILLIMETER-WAVE SOURCES FOR 60, 94, AND 140 GHZ	892	MANUFACTURING CONTROL
PROBLEM	SOLUTION		
TO ESTABLISH A MANUFACTURING CAPABILITY FOR PRODUCTION OF IMPATT DIODES WHICH ARE UNIFORM ENOUGH TO BE FIELD REPLACEABLE IN ARMY SYSTEMS.	ESTABLISH TECHNIQUES AND PROCESSES CAPABLE OF PRODUCING SILICON DOUBLE DRIFT IMPATT SOURCES. PRECISE AND RIGOROUS COMPUTER CONTROL OF ALL MATERIAL IS REQUIRED.		

WORK STATUS

- PROJECT IS TO BE JOINTLY FUNDED WITH AIR FORCE. A CONTRACTOR WILL USE COMPUTER CONTROL OF EPITAXIAL GROWTH SYSTEM AND DEVICE PROCESSING TO MAKE SILICON IMPATT DIODE SOURCES FOR RADAR TARGET DETECTION AND HOMING. AF PORTION NOT YET FULLY FUNDED.

PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
80 3445	PRECISION MACHINING OF OPTICAL COMPONENTS	400	MANUFACTURING CONTROL
PROBLEM	SOLUTION		
EXISTING PRECISION MACHINING FACILITIES CANNOT KEEP UP WITH THE DEMAND. MEET OPTICAL DESIGN REQUIREMENTS. MEET PRODUCTION SCHEDULES, AND STAY WITHIN REASONABLE COST BOUNDARIES.	INTEGRATE BOTH THE WELL PROVEN ERDA DEVELOPED SINGLE POINT DIAMOND MACHINING CAPABILITIES AND THE DEVELOPING INTERFEROMETRIC AIDED AND COMPUTER CONTROLLED TECHNOLOGY INTO A MANUFACTURING METHOD.		

PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
80 4322	CHARACTERIZE DORMANCY EFFECT ON ELECTRONIC EQUIPMENT	515	MANUFACTURING CONTROL
PROBLEM	SOLUTION		
UNCERTAINTY OF THE EFFECT OF LONG TERM STORAGE DURING PLANT LAYAWAY ON ELECTRONIC CONTROL SYSTEMS AND THE ASSOCIATED IMPACT ON PRODUCTION BASE LEAD TIME.	ANALYZE DATA CONCERNING DEGRADATION OF ELECTRONIC SYSTEMS DURING PERIODS OF DORMANCY AND DEVELOP CRITERIA FOR LAYAWAY PLANNING AND FUTURE SYSTEM DESIGN.		

WORK STATUS

- AGREEMENT HAS BEEN REACHED WITH 5 ADDITIONAL OPERATING CONTRACTORS OF ARMY AMMO PLANTS TO PARTICIPATE IN THIS PRT. MAINTENANCE METHODOLOGY CONTRACTS FOR ARMY AMMO PLANTS WERE REVIEWED PRIOR TO AWARD.

ARMY CACCAM PROJECTS
08/29/80

PROJ NUMBEP TITLE PROJ COST

* 6 80 7928 ROBOTIZED BENCHING OPERATIONS 113
PROBLEM TECHNOLOGY AREA

* BENCHING OPERATIONS ON FRECHBLOCKS AND RINGS ARE DEVELOP INCUSTRIAL ROBOT TO PERFORM THESE OPERATIO NAT HANDLING/STORAGE
UNSAFE AND TIME CONSUMING.
WORK STATUS

* EVALUATIONS OF 14 DIFFEENT MANUFACTURERS ROEOTS HAS BEGUN. TO DATE MOST OF THESE COMPANIES ROBOTS D
O NOT SEEM AMENABLE TO SOLVINGTHE PROBLEM

PROJ NUMBER TITLE PROJ COST

* R 80 3169 OPTICAL INSP OF PRINTED CIRCUIT BOARDS 50
PROBLEM TECHNOLOGY AREA

* OPERATOR FATIGUE ALLONS MANY BAD PCBOS TO PASS VI PROVIDE AN AUTOMATED OPTICAL COMPARATOR TO ELIMINA TEST, INSP, EVAL
SUAL INSPECTION. TE THE NEED FOR HUMAN INSPECTOR.

WORK STATUS

* AN OPERATING INSPECTION SYSTEM WAS DESIGNED AND ASSEMBLED, AND USED TO ESTABLISH OPERATING PARAMETER S, CAPABILITY, AND COST EFFECTIVITY ON A HIGH SPEED PRODUCTION LINE. CHRYSLER IS OPERATING THIS SYST EM FOR AUTOMATIC OPTICAL INSPECTION OF PUB.

PROJ NUMBER TITLE PROJ COST

* 1 80 7371 INTEGRATED BLADE INSPECTION SYSTEM (IBIS) 100
PROBLEM TECHNOLOGY AREA

* INSPECTION OF TURBINE ENGINE BLADES AND VANES NEC THIS PROJECT WILL IMPROVE THE INFRARED, X-RAY, AND
ESSITATES HIGH ACCURACY. THE EFFORT IS TIME CONSU INFRARED THERMOGRAPHY INSPECTION MODULES BY INCRE
MING AND SUSCEPTABLE TO ERROR. ASING RELIABILITY, REPEATABILITY AND SENSITIVITY.
ALSO, INSPECTION COSTS WILL BE REDUCES.

WORK STATUS

* THIS PROJECT WAS JUST FUNDED. NO STATUS REPORT IS REQUIRED.

ARMY CADCAM PROJECTS
08/29/80

PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
5 80 3961	IMPR (3-D) VIB ACCEPT TSTNG F ART FUZES AND S/A MECHANISMS	352	TEST, INSP, EVAL
PROBLEM			
SOLUTION			
* CURRENT METHODS ARE COSTLY AND TIME CONSUMING. RA RELY EXPOSE THE TEST ITEM TO TRUE SERVICE ENVIRON MENTS, AND REQUIRE THREE TESTS TO ACCOUNT FOR ALL TEST AXES.			
USE OF COMPUTERIZED 3-D VIBRATION / SHOCK TESTING AS AN ACCEPTANCE TOOL SOLVES TECHNICAL + ECONOMIC TEST DEFICIENCIES. TEST TIME IS REDUCED			
WORK STATUS			
* SEE PROJECT 5 79 3961 FOR PHASE I WORK. A FUNDING DECREASE IS CAUSING SCHEDULING PROBLEMS. GOOD TECH NICAL PROGRESS IS BEING MADE.			

FISCAL YEAR

81

CAM RELATED

MM&T

PROJECTS

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE PROJ COST

* 3 61 1071 HYBRID INTEGRATED CAD AND MANUFACTURING (MICADAM) 1000

PROBLEM SOLUTION TECHNOLOGY AREA

* HYBRID CIRCUIT DESIGN AND MANUFACTURE IS LABOR IN ANALYZE FUNCTIONAL FLOW AND MANUFACTURING PROCESS ARCHITECTURE
TEWSIVE. THE CAD DATA BASE HAS NOT BEEN EXTENDED T CAPABLE OF DEFINING FUNCTIONS, INPUT, OUTPUT, CO
TO MANUFACTURING PROCESS CONTROL. NITROLS AND INTERFACES. USE ICAM METHODOLOGY TO DEV
ELOP SYSTEM ARCHITECTURE.

PROJ NUMBER TITLE PROJ COST

* 3 81 1075 ELECTRONICS COMPUTER AIDED MANUFACTURING (ECAM) 2500

PROBLEM SOLUTION TECHNOLOGY AREA

* ALTHOUGH INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRINTED CIRCUITS, AND CABLES ARE DESIGNED ON A COMPUTER, THERE IS LITTLE COMPUTERIZED CONTROL OF PROCESS USED TO PRODUCE THESE ITEMS. A MASTER PLAN IS NEEDED TO DEFINE THE AREA AND REQUIREMENTS. ELECTRONIC TECHNOLOGIES TO MAKE INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRINTED CIRCUITS, AND CABLES.

PROJ NUMBER TITLE PROJ COST

* M 81 5006 LOW COST FABRICATION OF RF CAVITIES FOR TWTs 768

PROBLEM SOLUTION TECHNOLOGY AREA

* HIGH COSTS OF COUPLED CAVITY TRAVELING WAVE TUBES PROVIDE LOW COST MANUFACTURING TECHNIQUES FOR THE FABRICATION CAD/CAM
IS DUE TO THE COST OF FABRICATING AND ASSEMBLING FABRICATION OF THE RF CAVITY STRUCTURE. APPLY COMP
THE PRECISION RF CAVITIES. EM SYSTEMS REQUIRE LOWER CONTROL TECHNOLOGY WITH DIAMOND TOOLS IN LIEU
* COST WIDE BAND JAMMER TUBES FOR AIRCRAFT SURVIVAL OF CONVENTIONAL MACHINING.

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE PROJ COST

* H 81 9245 HMT COMPUTER-AIDED FLIR ASPHERIC LENS FABRICATION CAM 518
PROBLEM

* ASPHERIC LENSES REQUIRED BY FLIR SENSORS HAVE SEVERE WEIGHT AND SIZE LIMITATIONS AND ARE DIFFICULT TO MFG. BECAUSE OF THE REPETITIVE PROCESS OF SURFACE SHAPING.
SOLUTION
* PROVIDE MANUFACTURING METHODS FOR PRODUCING ASPHERIC FLIR LENSES USING A SINGLE POINT DIAMOND TURNING LATHE INTEGRATED WITH COMPUTER CONTROLS AND LASER INTERFEROMETRIC FEEDBACK OF CUTTING TOOL POSITION.
TECHNOLOGY AREA
FABRICATION CAD/CAM

PROJ NUMBER TITLE PROJ COST

* T 81 5082 FLEXIBLE MACHINING SYS (FMS) PILOT LINE F/TCV COMPONENTS 680
PROBLEM

* PARTS FOR TRACKED COMBAT VEHICLES ARE TYPICALLY NOT MANUFACTURED IN LARGE QUANTITIES. BECAUSE OF THIS, MASS PDM TECHNOLOGIES THAT RESULT IN LOWER PRODUCTION COSTS ARE NOT USED.
SOLUTION
* THE ADVANTAGES OF MASS PDM CAN BE REALIZED IN PRODUCING MEDIUM QUANTITY SIZE LOTS BY A CONCEPT KNOWN AS FLEXIBLE MACHINING SYSTEMS. THIS PROJECT WILL ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO UTILIZE FMS FOR THE MFG OF ARMY MATERIEL.
TECHNOLOGY AREA
FABRICATION CAD/CAM

PROJ NUMBER TITLE PROJ COST

* T 81 5086 LASER HARDENING OF TRANSMISSION COMPONENTS CAM (PHASE I) 255
PROBLEM

* FLAME AND INDUCTION HARDENING IS EMPLOYED TO SURFACE HARDEN VEHICLE TRANSMISSION PARTS. THESE PROCESSES ARE INEFFICIENT.
SOLUTION
* ESTABLISH PARAMETERS AND CONTROLS NEEDED FOR LASER SURFACE HARDENING
TECHNOLOGY AREA
FABRICATION CAD/CAM

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE PROJ COST

* T 31 5051 HEAVY ALUMINUM PLATE FABRICATION (PHASE I) 420

PROBLEM SOLUTION TECHNOLOGY AREA

* MANY COMBAT AND TACTICAL VEHICLE HULLS AND THEIR COMPONENTS ARE FABRICATED FROM HEAVY ALUMINUM PLATE. CUTTING THIS HEAVY ALUMINUM PLATE TO SPECIFIC D CONTOURS AND WELDING THE PIECES TOGETHER REQUIRES A GREAT DEAL OF MANUAL LABOR.
ESTABLISH THE CAPABILITY TO CUT HEAVY ALUMINUM PLATE RAPIDLY USING PLASMA ARC WITH NUMERICAL CONTROL S. PROCESS PARAMETERS WILL BE ESTABLISHED FOR GAS METAL ARC, GAS TUNGSTEN ARC, AND ELECTRON BEAM WELDING OF HEAVY ALUMINUM PLATE.
FABRICATION CAD/CAM

PROJ NUMBER TITLE PROJ COST

* 1 31 7193 SEMI-AUTO COMP MANUF SYS F/HELI FUSELAGE SECONDARY STRUC 300

PROBLEM SOLUTION TECHNOLOGY AREA

* HELICOPTER FUSELAGE STRUCTURES HAVE HIGH MANUFACTURING COST DUE TO HIGH PART COUNT AND HIGH ASSEMBLY COSTS. METHODS OF COMPOSITE FABRICATION HAVE BEEN INVESTIGATED BUT HAND OPERATIONS RESULT IN HIGH LABOR COSTS.
USE EQUIPMENT AND TECHNIQUES DEVELOPED BY INDUSTRY IN SUPPORT OF AIR FORCE COMPOSITE COMPONENT PROGRAMS. THE SELECTED SYSTEM WILL BE UPDATED AND MODIFIED TO ACCOMMODATE HELICOPTOR COMPONENTS WHICH ARE MORE COMPLEX AND HAVE MORE CURVATURE THAN AF COMP.
FABRICATION CAD/CAM

PROJ NUMBER TITLE PROJ COST

* 6 61 7367 PROGRAMMED OPTICAL SURFACING EQUIPMENT/METHODOLOGY 126

PROBLEM SOLUTION TECHNOLOGY AREA

* CURRENT TECHNIQUES FOR PITCH BUTTONING AND BLOCKING PRECISION LENSES USE OLDER CONVENTIONAL EQUIPMENT. ACCURACY DEPENDS ON THE SKILL AND EXPERIENCE OF WELL TRAINED MASTER OPTICIANS WHO ARE BECOMING SCARCER.
ADAPT COMPUTER TECHNIQUES AND INSTRUMENTATION WITH CONTROLS TO PITCH BUTTONING AND BLOCKING OPERATIONS. THE END PRODUCT WILL BE AN INTEGRATED SURFACING SYSTEM IMPLEMENTED IN THE FIRE CONTROL FABRICATION FACILITY AT ARRAIDCOM.
FABRICATION CAD/CAM

ARMY CAD/CAM PROJECTS
06/29/80

PROJ NUMBER TITLE PROJ COST

* 6 81 8051 APPLICATION AND CONTROL OF MACHINE TOOLS 85
PROBLEM SOLUTION

* CURRENT PROCEDURES FOR THE JUSTIFICATION, SELECTION, APPLICATION, AND MAINTENANCE OF MACHINE TOOLS ARE INADEQUATE TO AVOID PROCUREMENT OF INEFFECTIVE, UNRELIABLE MACHINE TOOLS.
TECHNOLOGY AREA
DATA BASE/DATA AUTOMATION

PROJ NUMBER TITLE PROJ COST

* F 81 3005 GRAPHICAL PART PROGRAMMING EVALUATION (CAM) 125
PROBLEM SOLUTION

* POTENTIAL EXISTS TO EXTEND THE EXISTING COMPUTER-AIDED INTERACTIVE DESIGN SYSTEMS FOR THE CREATION OF NUMERICAL CONTROL TAPES AND THREE-DIMENSIONAL PARTS GEOMETRIES TO A BROAD RANGE OF GOD EQUIPMENT REQUIREMENTS.
TECHNOLOGY AREA
CAD/CAM INTERACTION

PROJ NUMBER TITLE PROJ COST

* F 81 3036 CAD/CAM OF SPECIAL ELECTRONIC CIRCUITS (CAM) 1000
PROBLEM SOLUTION

* SEMICONDUCTOR INTEGRATED CIRCUITS NEEDED FOR SPECIAL COMMUNICATIONS EQUIP. MUST BE CUSTOM DESIGNED FOR EACH NEW APPLICATION. EACH IC REQUIRES SEVERAL MASK SETS AND A NUMBER OF IC ARE REQUIRED FOR EACH DEVICE. CONSIDERABLE ARTWORK IS REQUIRED.
TECHNOLOGY AREA
CAD/CAM INTERACTION

ARMY CAD/CAM PROJECTS
08/29/80

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	3 81 1021	CPPP MACHINED CYLINDRICAL PARTS (CAM)	250	PLANNING/GROUP TECH
***	PROBLEM	SOLUTION		
***	<p>PRESENT MANUAL METHOD FOR PRODUCTION PROCESS PLAN DEVELOP A COMPUTER SOFTWARE SYSTEM FOR PROCESS PLANNING OF MACHINED CYLINDRICAL METAL COMPONENTS ARE MACHINED CYLINDRICAL PARTS. THE SYSTEM WILL BE MANUFACTURER-INDEPENDENT AND WILL INCORPORATE A LACK OF STANDARDIZATION. PROCESS DECISION MODELING.</p>			
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	6 81 7724	GROUP TECHNOLOGY OF WEAPON SYSTEMS (CAM)	224	PLANNING/GROUP TECH
***	PROBLEM	SOLUTION		
***	<p>THERE IS A NEED TO REDUCE AND CONTROL THE PROLIFERATION OF PARTS AND DESIGNS FOR ITEMS MANUFACTURED AT WATERVLIET ARSENAL. THE ARMY HAS PURCHASED A GROUP CLASSIFICATION AND CODING SOFTWARE PACKAGE. ONCE THIS SYSTEM IS IMPLEMENTED, IT SHOULD BE POSSIBLE TO REDUCE THE NUMBER OF DIFFERENT PARTS THRU STANDARDIZATION.</p>			
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	7 81 6053	WELDING SYSTEMS INTEGRATION	350	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	<p>OF ALL METAL WORKING PROCESSES EMPLOYED IN TRACKED COMBAT VEHICLES MANUFACTURING, WELDING IS THE MOST LABOR INTENSIVE AND AFTER MACHINING, THE MOST COSTLY. AUTOMATION WHICH COULD REDUCE THESE COSTS IS AS YET AN UNACHIEVED GOAL. UNDERTAKE A COORDINATED PROGRAM TO INTEGRATE EXISTING EXPERTISE AND TECHNOLOGY TO ADDRESS ONE APPLICATION (XMI HULL). EXPERTISE WILL BE IN AREAS OF WELDING PROCESS CONTROL, SENSORY TECHNOLOGY, STRESS ANALYSIS, AND COMPUTER CONTROL.</p>			

ARMY CAD/CAM PROJECTS
08/29/80

* 3 61 3291 SILVER-ZINC GUIDANCE BATTERIES (CAM) PROJ COST 250

PROBLEM

* ANODE AND CATHODE MANUFACTURING FOR SILVER ZINC B DEVELOP A COMPUTER AIDED MANUFACTURING PROCESS FOR
BATTERIES IS BASED ON TWENTY YEAR OLD TECHNIQUES. SILVER-ZINC BATTERIES WITH CONTROLLING SENSORS FO
REQUIREMENTS CALL FOR IN LINE PRODUCTION AND ACCURATELY MEASURING MATERIALS AND ELECTROCHEMIC
PTANCE TESTS. AL COMBINATION.

TECHNOLOGY AREA

MANUFACTURING CONTROL

* 3 61 3445 PRECISION MACHINING OF OPTICAL COMPONENTS PROJ COST 625

PROBLEM

* EXISTING PRECISION MACHINING FACILITIES CANNOT KE INTEGRATE BOTH THE WELL PROVEN ERDA DEVELOPED SING
EP UP WITH THE DEMAND, MEET OPTICAL DESIGN REQUIR LE POINT DIAMOND MACHINING CAPABILITIES AND THE DE
EMENTS, MEET PRODUCTION SCHEDULES, AND STAY WITHI VELOPING INTERFEROMETRIC AIDED AND COMPUTER CONTR
N REASONABLE COST BOUNDARIES. LLED TECHNOLOGY INTO A MANUFACTURING METHOD.

TECHNOLOGY AREA

MANUFACTURING CONTROL

* 6 61 8120 ADAPTIVE CONTROL TECHNOLOGY (CAM) PROJ COST 225

PROBLEM

* INEFFICIENT USE OF NC MACHINE TOOLS DUE TO CONSER EXTEND THE CURRENT ADAPTIVE CONTROL TECHNOLOGY TO
VATION PROGRAMMING IS UNECONOMICAL. ALSO THE INAB CONTROL THE TOOL LOADS IN SMALL MILLS AND DRILLS S
ILITY TO MONITOR A MULTIPLICITY OF TOOL FORMS CHA Q THEY CAN BE PERFORMED IN THE SAME SETUPS. THIS M
RACTERISTIC OF NC MACHINE CAPABILITY, E.G. MANY D OULD MAXIMIZE THE USE OF BOTH NC EQUIPMENT AND TOO
RILL SIZES WITH DIFFERENT LOADING, IS A LIMITER. L SYSTEMS.

TECHNOLOGY AREA

MANUFACTURING CONTROL

ARMY CAD/CAM PROJECTS
08/29/80

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	6 81 8135	IN-PROCESS CONTROL OF MACHINING	653	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	DURING MFG. OF RECOIL CONTROL ORIFICES, ERRORS ARE INTRODUCED WHICH REQUIRE REWORK. CORRECTIVE ACTIONS INVOLVE COSTLY DETAILED INSPECTION AND REANALYSIS WITH COMPUTERIZED DESIGN PROGRAMS TO DEFINE POSSIBLE REWORK ALTERNATIVES.	AN IMPROVED MANUFACTURING METHOD UTILIZING ADAPTIVE CONTROLS AND AUTOMATED INSPECTION EQUIPMENT WILL BE ESTABLISHED. MACHINE TOOLS WILL BE RETROFITTED		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	6 81 8154	COMPUTER INTEGRATION MFG (CIM), DDNC	337	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	NUMERICAL CONTROL MACHINE TOOLS OFFER MANY ADVANTAGES OVER CONVENTIONAL MACHINE TOOLS BUT HAVE CERTAIN DISADVANTAGES. ONE PROBLEM AREA IS GETTING MACHINE INSTRUCTIONS TO THE MACHINE TOOL AND COLLECTING MANAGEMENT INFORMATION.	INTERFACE IN-HOUSE COMPUTER FACILITIES WITH CURRENT AND FUTURE NC MACHINE TOOLS TO FORM AN ADVANCED COMPUTER INTEGRATED MFG SYSTEM. UTILIZE CNC TECHNOLOGY.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	5 81 6716	DEV COMP-ATC MODEL OF FORMING OPERATIONS FOR ARTILLERY MPTS	157	SIM. MODEL. OP RESCH
***	PROBLEM	SOLUTION		
***	TRIAL AND ERROR METHODS AND THE ABSENCE OF PROVEN AUTOMATED DESIGN TECHNIQUES FOR TOOLING CAUSE UNEXPECTED FAILURES IN FORMING OPERATIONS AND DELAYS IN STARTUP OF AMMUNITION PRODUCTION LINES.	DEVELOP ANALYTICAL MODELS AND AUTOMATED TOOL DESIGN METHODS OF CRITICAL METAL FORMING OPERATIONS. TOOL DESIGNS THUS GENERATED WILL BE TESTED IN A PRODUCTION SETTING TO VERIFY THE COMPUTER MODELS. PROVEN MODELS ARE APPLICABLE TO CURRENT AND FUTURE ITE		

ARMY CAD/CAM PROJECTS
02/29/80

*** PROJ NUMBER TITLE PROJ COST

* 6 81 8136 IMPROVED IMPULSE PROGRAMMERS FOR HYDRAULIC SIMULATORS 80
PROBLEM SOLUTION TECHNOLOGY AREA

* UNDESIRABLE SHOCK AND VIBRATION IN TESTS OF CERTA DESIGN AND MANUFACTURE IMPROVED IMPULSE PROGRAMMER SIM, MODEL, OP RESCH
IN RECOIL MECHANISMS LIMIT THE EXTENT OF TESTING S TO GET BETTER SIMULATED FIRING THAT WILL BE MORE
THAT CAN BE ACCOMMODATED ON THE HYDRAULIC ARTILLER EFFECTIVE FOR A GREATER NUMBER OF WEAPONS.
Y TEST SIMULATOR.

*** PROJ NUMBER TITLE PROJ COST

* 6 81 7'28 ROBOTIZED PUNCHING OPERATIONS (CAM) 287
PROBLEM SOLUTION TECHNOLOGY AREA

* PUNCHING OPERATIONS ON FREECHBLOCKS AND RINGS ARE DEVELOP INDUSTRIAL ROBOT TO PERFORM THESE OPERATIO MAT HANDLING/STORAGE
UNSAFE AND TIME CONSUMING. NS.

*** PROJ NUMBER TITLE PROJ COST

* 1 81 7371 INTEGRATED BLADE INSPECTION SYSTEM (IBIS) 357
PROBLEM SOLUTION TECHNOLOGY AREA

* INSPECTION OF TURBINE ENGINE BLADES AND VANES NEC THIS PROJECT WILL IMPROVE THE INFRARED, X-RAY, AND
ESSITATES HIGH ACCURACY. THE EFFORT IS TIME CONSU INFRARED THERMOGRAPHY INSPECTION MODULES BY INCRE
MING AND SUSCEPTABLE TO ERROR. ASING RELIABILITY, REPEATABILITY AND SENSITIVITY.
ALSO, INSPECTION COSTS WILL BE REDUCES.

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE

3 81 1060 ELECTRICAL TEST AND SCREENING OF CHIPS

PROBLEM SOLUTION TECHNOLOGY AREA

ONE UNRELIABLE CHIP IN MILITARY ELECTRONIC ASSEMBLIES CAUSES REJECTION OR DESTRUCTION OF THE ENTIRE PACKAGE. PRESENT MEANS FOR DETERMINING CHIP RELIABILITY OR INTEGRITY IS A PROBE TESTING TECHNIQUE WHICH IS TIME CONSUMING AND DESTRUCTIVE.
PLACE A MONOLITHIC CHIP TESTING DEVICE AT THE POINT JUST BEFORE THE CHIP IS BONDED TO THE SUBSTRATE. INCLUDE ON THE PROBE A NON-DESTRUCTIVE POINT AND A METHOD FOR OXIDE REMOVAL.
TEST, INSP, EVAL

PROJ NUMBER TITLE

3 81 1073 REAL TIME ULTRASONIC IMAGING

PROBLEM SOLUTION TECHNOLOGY AREA

EXISTING ACOUSTICAL HOLOGRAPHY INSP. SYS PRODUCES UNSATISFACTORY VIDEO IMAGES DUE TO POOR RESOLUTION, SIGNAL NOISE AND LOW SPATIAL FREQ. ABERRATION S.
A 3 CHANNEL PIPELINE PROCESSOR WITH ASSOCIATED 512 X512MB MEMORIES WITH A 30 FRAMES/SEC DISPLAY CAPABILITY. THIS SYS WOULD ELIMINATE ABERRATION, IMPROVE CONTRAST, AND REDUCE SIGNAL NOISE.
TEST, INSP, EVAL

PROJ NUMBER TITLE

3 81 1076 PATTERN RECOGNITION OF COMPONENTS F/HYBRID CIRCUIT SUBSTRATE

PROBLEM SOLUTION TECHNOLOGY AREA

OPTICAL INSPECTION OF HYBRIDS BY AN OPERATOR IS INEFFICIENT DUE TO HUMAN FATIGUE INTRODUCED BY REPETITIVE INSPECTION OF SMALL CIRCUITS. A COMPUTER CONTROLLED OPTICAL PATTERN RECOGNITION SYSTEM FOR COMPLEX HYBRID CIRCUITS IS NEEDED.
MODIFY EXISTING OPTICAL PATTERN RECOGNITION EQUIPMENT TO RECOGNIZE COMPONENT AND PAD ALIGNMENT FOR LARGE NUMBERS OF ELECTRONIC DEVICES PER SUBSTRATE.
TEST, INSP, EVAL

FISCAL YEAR

82

CAM RELATED

MM&T

PROJECTS

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE PROJ COST

* 3 82 1075 ELECTRONICS COMPUTER AIDED MANUFACTURING (ECAM) 1000

PROBLEM SOLUTION TECHNOLOGY AREA

* ALTHOUGH INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRINTED CIRCUITS AND CABLES ARE DESIGNED ON A COMPUTER, THERE IS LITTLE COMPUTERIZED CONTROL OF PROCESSES USED TO PRODUCE THESE ITEMS. A MASTER PLAN IS NEEDED TO DEFINE THE AREA AND REQUIREMENTS.
* DEVELOP A MOD MASTER PLAN FOR COMPUTER-AIDED DESIGN AND MFG OF ELECTRONIC SYSTEMS. USE AIR FORCE'S ICAM AND NASA'S IPAD PROGRAMS TO DEFINE CAD/CAM AND ELECTRONIC TECHNOLOGIES TO MAKE INTEGRATED CIRCUITS, HYBRID CIRCUITS, PRINTED CIRCUITS, AND CABLES.
ARCHITECTURE

PROJ NUMBER TITLE PROJ COST

* T 82 5032 FLEXIBLE MACHINING SYS (FMS) PILOT LINE F/TCV COMPONENTS 750

PROBLEM SOLUTION TECHNOLOGY AREA

* PARTS FOR TRACKED COMBAT VEHICLES ARE TYPICALLY MFGED IN LARGE QUANTITIES. BECAUSE OF THIS, MASS PDM TECHNOLOGIES THAT RESULT IN LOWER PDM COSTS ARE NOT USED.
* THE ADVANTAGES OF MASS PDM CAN BE REALIZED IN PRODUCTION USING MEDIUM QUANTITY SIZE LOTS BY A CONCEPT KNOWN AS FLEXIBLE MACHINING SYSTEMS. THIS PROJECT WILL ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO UTILIZE FMS FOR THE MFG OF ARMY MATERIEL.
FABRICATION CAD/CAM

PROJ NUMBER TITLE PROJ COST

* T 82 5091 HEAVY ALUMINUM PLATE FABRICATION 180

PROBLEM SOLUTION TECHNOLOGY AREA

* MANY COMBAT AND TACTICAL VEHICLE HULLS AND THEIR COMPONENTS ARE FABRICATED FROM HEAVY ALUMINUM PLATE. CUTTING THIS HEAVY ALUMINUM PLATE TO SPECIFIED CONTOURS AND WELDING THE PIECES TOGETHER REQUIRES A GREAT DEAL OF MANUAL LABOR.
* ESTABLISH THE CAPABILITY TO CUT HEAVY ALUMINUM PLATE RAPIDLY USING PLASMA ARC WITH NUMERICAL CONTROL. PROCESS PARAMETERS WILL BE ESTABLISHED FOR GAS METAL ARC, GAS TUNGSTEN ARC, AND ELECTRON BEAM WELDING OF HEAVY ALUMINUM PLATE.
FABRICATION CAD/CAM

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE

* T 82 6008 LASER MACHINING (PHASE 1)
PROBLEM

* CONVENTIONAL MACHINING OF DIFFICULT TO MACHINE MATERIALS IS VERY EXPENSIVE. RAPID TOOL WEAR AND LOCALIZED HEATING OF THE WORKPIECE IMPACT REMOVAL RATES AND METALLURGICAL CHARACTERISTICS.
SOLUTION
THIS PROGRAM WILL DEVELOP TECHNIQUES FOR LASER MACHINING BY NUMERICAL CONTROL.
TECHNOLOGY AREA
FABRICATION CAD/CAM

PROJ COST

250

PROJ NUMBER TITLE

* J 82 1095 AUTOMATIC SEALING OF HYBRIDS
PROBLEM

* SEALING OF SMALL METAL PACKAGES IS DONE BY HAND SOLDERING OR HAND-GUIDED ELECTRIC SEAM WELDING. BOTH REQUIRE AN OPERATOR.
SOLUTION
DEVELOP A COMPUTER DIRECTED SOLDERING TECHNIQUE OR APPLY COMPUTER CONTROL TO THE SEAM WELDER. SET UP MEANS TO LOCATE THE PACKAGE AND LTD IN A FIXTURE. TO CHECK ALIGNMENT. CONTROL THE CLOSURE OPERATION TEST THE SEAL WHILE STILL IN THE INERT ATMOSPHERE
TECHNOLOGY AREA
FABRICATION CAD/CAM

PROJ COST

250

PROJ NUMBER TITLE

* 6 82 8226 COMPUTER AIDED WORK MEASUREMENT SYSTEM
PROBLEM

* TIME STUDIES AND USE OF STANDARD DATA PRESENTLY REQUIRE TIME CONSUMING MANUAL CALCULATIONS TO DEVELOP PRODUCTION STANDARDS.
SOLUTION
DEVELOP A COMPUTERIZED WORK MEASUREMENT SYSTEM THAT WILL VIRTUALLY ELIMINATE MANUAL CALCULATIONS IN THE DEVELOPMENT OF PRODUCTION STANDARDS. ROUTINES WILL INCLUDE PROGRAMS TO DEVELOP FINISHED STANDARDS FROM RAW TIME STUDIES OR STANDARD DATA.
TECHNOLOGY AREA
DATA BASE/DATA AUTOMATION

PROJ COST

205

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE PROJ COST

* F 82 3036 CAD/CAM OF SPECIAL ELECTRONIC CIRCUITS 1000
PROBLEM

* SEMICONDUCTOR INTEGRATED CIRCUITS NEEDED FOR SPECIAL COMMUNICATIONS EQUIP. MUST BE CUSTOM DESIGNED FOR EACH NEW APPLICATION. EACH IC REQUIRES SEVERAL MASK SETS AND A NUMBER OF IC ARE REQUIRED FOR EACH DEVICE. CONSIDERABLE ARTWORK IS REQUIRED.
SOLUTION DEVELOP COMPUTER AIDED MANUFACTURING TECHNIQUES THAT WILL REDUCE THE COST OF AND IMPROVE THE RELIABILITY OF SEMICONDUCTOR INTEGRATED CIRCUITS
TECHNOLOGY AREA
CAD/CAM INTERACTION

PROJ NUMBER TITLE PROJ COST

* T 82 5005 COMPUTER AIDED DESIGN FOR COLD FORGED GEARS (PHASE I) 300
PROBLEM

* MACHINING AND OTHER PROCESSES ADD COST TO THE FINISHED COMPONENT.
SOLUTION ESTABLISH A MFG PROCESS TO RESULT IN A FINISHED GEAR TO DRAWING TOLERANCES FROM BAR STOCK AT AMBIENT TEMPERATURES.
TECHNOLOGY AREA
CAD/CAM INTERACTION

PROJ NUMBER TITLE PROJ COST

* T 82 5024 GEAR DIE DESIGN AND MFG UTILIZING COMPUTER TECHNOLOGY \CAM* 640
PROBLEM

* THE CONTROL OF DIMENSIONAL TOLERANCES OF FORGED BEVEL GEARS PRESENTS A UNIQUE PROBLEM SINCE THESE GEARS ARE NOT MFG. TO THEORETICAL EQUATIONS. THE BEVEL GEAR IS NOT DEFINED DIMENSIONALLY BUT IS PRESENTED AS REQUIREMENTS FOR TOOTH BEARING PATTERN.
SOLUTION THIS PROGRAM WILL ELIMINATE THE CURRENT TRIAL AND ERROR METHODS BY UTILIZING CAD/CAM METHODS AND INTERACTIVE GRAPHICS TECHNIQUES. EXCESSIVE SCRAP, UNEXPTECTED DIE WEAR AND BREAKAGE, AND THE HIGH COST OF FORGING DIES WILL BE ADDRESSED.
TECHNOLOGY AREA
CAD/CAM INTERACTION

ARMY CAD/CAM PROJECTS
06/29/80

PROJ NUMBER TITLE PROJ COST

* 3 82 1072 MULTIPLE HI RELIABILITY/LOW VOLUME LSI PFG VCAP* 1200
PROBLEM SOLUTION TECHNOLOGY AREA

* LOW VOLUME PURCHASE OF LSI CHIPS DOES NOT LEND IT ANALYZE ALL LSI RESEARCH RESULTS AND SINGLE OUT NE CAD/CAM INTERACTION
SELF TO CIRCUIT VARIATIONS. LARGER THAN NEEDED NU W PROCESSING TECHNIQUES. ESTABLISH A MILITARY CAPT
MERS OF CHIPS MUST BE ORDERED TO GET THE PRODUCE IVE DESIGN AND PRODUCTION LINE. DEVELOP SOFTWARE F
R'S ATTENTION. A LOW-VOLUME CHIP CAPABILITY IS NE OR CAD OF LSI CIRCUITS. PRODUCE VARIATIONS OF SEVE
EDED. RAL CIRCUIT FAMILIES.

PROJ NUMBER TITLE PROJ COST

* 6 82 8231 IMPROVED CASTING TECHNOLOGY 200
PROBLEM SOLUTION TECHNOLOGY AREA

* EXCESSIVE METAL MUST BE MELTED IN CASTING OPERATI NG FACILITIES. THE OPTIMUM SHAKE OUT TIMES, RISER
ONS. THE YIELD RATIO OF SOME CASTS IS TOO LOW AND SLEEVES AND GATING AND RISERING CONFIGURATIONS WOU
THE GATES AND RISERS TOO DIFFICULT TO CUT OFF. M LD BE DETERMINED. PROPERTIES OF CAST MATERIALS WIL
ATERIAL PROPERTIES OFTEN VARY WITH CASTING PROCED L BE EVALUATED FOR DIFFERENT CAST DESIGNS.

PROJ NUMBER TITLE PROJ COST

* 7 82 6030 COMPUTER SIM OF TCV MANUFACTURING PROCESS* 300
PROBLEM SOLUTION TECHNOLOGY AREA

* THE LONG LEAD TIMES REQUIRED IN THE MATERIAL ACQU SIMULATING THE MANUFACTURING PROCESS DURING THE VE
ISITION PROCESS OF TRACKED COMBAT VEHICLES (TCV) HICLE DEVELOPMENT PHASE WILL IDENTIFY TOOLING, OPT
DO NOT ALLOW COMPONENTS TO REFLECT THE LATEST TEC INUM MANUFACTURING PROCESSES, OPTIMUM PRODUCTION L
MNOLOGIES. THIS LEADS TO DELAYS AND EXCESSIVE COS INE, AND PGTENTIAL PRODUCTION PROBLEMS. IT WILL AS
TS. SIST INNOVATION AND PROVIDE FOR ACCURATE PLANNING.

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER SUBTASK TITLE PROJ COST

* T 82 6057 12 COMPUTER SIM OF TCV MANUFACTURING PROCESS 300
PROBLEM SOLUTION TECHNOLOGY AREA

* THE FUEL EFFICIENCY OF THE XM1 NEEDS IMPROVEMENT. THE FUEL EFFICIENCY CAN BE INCREASED BY RAISING THE TURBINE INLET TEMPERATURE. THE ELEVATED TURBINE INLET TEMPERATURES WILL REQUIRE MATERIALS THAT CAN WITHSTAND HIGH TEMPERATURES AND PRESSURES. THIS PROJECT WILL PROVIDE THE NECESSARY TECHNOLOGY. PLANNING/GROUP TECH

PROJ NUMBER TITLE PROJ COST

* T 82 6041 INTEGRATED APP OF ADAPTIVE CONTROL FOR MACH TOOLS AND ROBOTS 500
PROBLEM SOLUTION TECHNOLOGY AREA

* SENSORS WHICH RECOGNIZE AND SIGNAL PHENOMENAL CHANGES HAVE BEEN DEVELOPED AND DEMONSTRATED. APPLICATION OF THESE TO ADAPTIVE CONTROL CAN ADVANCE AUTOMATION TO THE LEVEL OF "PUSH BUTTON" FACTORIES, BUT LITTLE OR NOTHING HAS BEEN DONE IN THIS AREA. STATE-OF-THE-ART SENSORS WILL BE ADAPTED TO A CNC MACHINING CENTER TO ADVANCE ITS PERFORMANCE BEYOND PRESENT LEVELS OF EFFICIENCY. THIS WILL PROVIDE A PROVEN CAPABILITY WHICH CAN BE EMPLOYED ON OTHER MACHINES. MANUFACTURING CONTROL

PROJ NUMBER TITLE PROJ COST

* T 82 6053 WELDING SYSTEMS INTEGRATION 500
PROBLEM SOLUTION TECHNOLOGY AREA

* OF ALL METAL WORKING PROCESSES EMPLOYED IN TRACKED COMBAT VEHICLES MANUFACTURING, WELDING IS THE MOST LABOR INTENSIVE AND AFTER MACHINING, THE MOST COSTLY. AUTOMATION WHICH COULD REDUCE THESE COSTS IS AS YET AN UNACHIEVED GOAL. UNDERTAKE A COORDINATED PROGRAM TO INTEGRATE EXISTING EXPERTISE AND TECHNOLOGY TO ADDRESS ONE APPLICATION (XM1 HULL). EXPERTISE WILL BE IN AREAS OF WELDING PROCESS CONTROL, SENSORY TECHNOLOGY, STRESS ANALYSIS, AND COMPUTER CONTROL. MANUFACTURING CONTROL

ARMY CAD/CAM PROJECTS
08/29/80

PROJ NUMBER TITLE PROJ COST

* 1 82 7345 IN-PROCESS CONTROL OF RESIN MATRIX CURE 200
PROBLEM SOLUTION

* CONVENTIONAL CONTROL OF THE CURE STAGE DURING COM
POSITE HARDWARE MANUFACTURING IS ATTAINED THROUGH
MANUAL OR AUTOMATIC CONTROL OF THE AUTOCLAVE/PRE
SS TEMPERATURE AS A FUNCTION OF TIME. THIS METHOD
IGNORES THE CHEMICAL STATE OF THE RESIN DURING *

TECHNOLOGY AREA

MANUFACTURING CONTROL

PROJ NUMBER TITLE PROJ COST

* 3 82 1079 WIDE AREA MERCURY-CADMIUM-TELLURIDE QUADRENT DETECTORS 350
PROBLEM SOLUTION

* LARGE AREA MERCURY-CADMIUM-TELLURIDE QUADRENT DE
TECTORS FOR IR SEEKERS ARE EXPENSIVE BECAUSE OF H
IGH MATERIAL COST AND LOW YIELD. THE MATERIAL IS
HARD TO GROW TO THE RIGHT CHEMICAL BALANCE. SLICI
NG, ION IMPLANTATION AND/OR DIFFUSION ARE TOUCHY.

TECHNOLOGY AREA

MANUFACTURING CONTROL

PROJ NUMBER TITLE PROJ COST

* 6 82 7707 AUTOMATED PROCESS CONTROL FOR MACHINING 133
PROBLEM SOLUTION

* MACHINING OPERATIONS ARE SELECTED, PARAMETERS ARE
SET, AND STANDARDS ARE ESTABLISHED EMPIRICALLY W
ITH LITTLE OR NO ENGINEERING ANALYSES, CONTROL OR
FEEDBACK.

TECHNOLOGY AREA

MANUFACTURING CONTROL

ARMY CAD/CAM PROJECTS
08/29/88

...	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
...
...	6 82 8135	IN-PROCESS CONTROL OF MACHINING	557	MANUFACTURING CONTROL
...	PROBLEM	SOLUTION		
...	<p>* DURING MFG. OF RECOIL CONTROL ORIFICES, ERRORS ARE INTRODUCED WHICH REQUIRE REMARK. CORRECTIVE ACTIONS INVOLVE COSTLY DETAILED INSPECTION AND REANALYSIS WITH COMPUTERIZED DESIGN PROGRAMS TO DEFINE POSSIBLE REMARK ALTERNATIVES.</p>			
...
...	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
...
...	6 82 8241	COMPUTER DIAGNOSTICS + CONTROL FOR BORE GUIDANCE	303	MANUFACTURING CONTROL
...	PROBLEM	SOLUTION		
...	<p>* THE BORE GUIDANCE SYSTEM CONSISTS OF MANY INTERDEPENDENT ELEMENTS MAKING IT DIFFICULT AND TIME CONSUMING TO DIAGNOSE PROBLEMS. ALSO, TUBES WITH LARGE WALL VARIATIONS GREATLY INCREASE THE DIFFICULTY IN MAINTAINING CONTROL.</p>			
...
...	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
...
...	6 82 8244	OPTIMIZE THE HEAT TREATMENT OF ROTARY FORGE TUBES	286	SIM, MODEL, OP RESCH
...	PROBLEM	SOLUTION		
...	<p>* ROTARY FORGED TUBES ARE CURRENTLY HEAT TREATED BASED ON HISTORICAL DATA. IF THE INITIAL CYCLE DOES NOT RESULT IN ADEQUATE PROPERTIES ADDITIONAL CYCLES ARE PERFORMED UNTIL ACCEPTABLE PROPERTIES ARE ATTAINED.</p>			
...

ARMY CACCAM PROJECTS
08/29/80

PROJ NUMBER TITLE PROJ COST

* F 82 3069 FUNCTIONAL SEGMENTATION OF THE AN/USM-410 120
PROBLEM

* ARMY ELECTRONIC ITEMS MUST BE TESTED ON EXPENSIVE
AUTOMATIC TESTERS THAT CONTAIN MORE CAPABILITY T
HAN NEEDED AND COST MORE THAN MOST FIRMS CAN AFFO
RD.
SOLUTION
RECONFIGURE THE AN/USM-410 EQUATE TESTER TO PERMIT
A MINIMUM OF MODULES TO DO SOME LOW ORDER TESTING
AND PERMIT ADD-ONS TO BE ADDED TO UPGRADE THE GEA
R TO HANDLE ADDITIONAL TESTS AS NEEDED. WORK ON SO
FTWARE COMPATIBILITY.
TECHNOLOGY AREA
TEST, INSP, EVAL

PROJ NUMBER TITLE PROJ COST

* Q 82 8073 COMPUTERIZED COLOR MATCHING SYSTEM 218
PROBLEM

* COLOR ACCEPTABILITY IS THE MOST TROUBLESOME PROBL
EM IN CENTRAL COD PROCUREMENT OF TEXTILE FOR CLOT
HING THE MILITARY SERVICES.
SOLUTION
AN INSTRUMENTAL COLOR INSPECTION SYSTEM ADAPTED TO
VOLUME PRODUCTION OF TEXTILES, A SYSTEM WITH GREA
TER RELIABILITY, PRECISION AND CONSISTENCY.
TECHNOLOGY AREA
TEST, INSP, EVAL

PROJ NUMBER TITLE PROJ COST

* 1 82 7371 INTEGRATED BLADE INSPECTION SYSTEM (IBIS) 654
PROBLEM

* INSPECTION OF TURBINE ENGINE BLADES AND VANES NEC
ESSTATES HIGH ACCURACY. THE EFFORT IS TIME CONSU
MING AND SUSCEPTABLE TO ERROR.
SOLUTION
THIS PROJECT WILL IMPROVE THE INFRARED, X-RAY, AND
INFRARED THERMOGRAPHY INSPECTION MODULES BY INCRE
ASING RELIABILITY, REPEATABILITY AND SENSITIVITY.
ALSO, INSPECTION COSTS WILL BE REDUCES.
TECHNOLOGY AREA
TEST, INSP, EVAL

ARMY CAD/CAM PROJECTS
06/29/80

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	3 82 1076	AUTOMATIC RECOGNITION OF CHIPS	400	TEST, INSP, EVAL
***	PROBLEM	SOLUTION		
***	OPTICAL INSPECTION OF HYBRIDS BY AN OPERATOR IS INEFFICIENT DUE TO HUMAN FATIGUE INTRODUCED BY REPETITIVE INSPECTION OF SMALL CIRCUITS. A COMPUTER CONTROLLED OPTICAL PATTERN RECOGNITION SYSTEM FOR COMPLEX HYBRID CIRCUITS IS NEEDED.	MODIFY EXISTING OPTICAL PATTERN RECOGNITION EQUIPMENT TO RECOGNIZE COMPONENT AND BOND PAD ALIGNMENT FOR LARGE NUMBERS OF ELECTRONIC DEVICES PER SUBSTRATE.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	3 82 1092	AUTOMATIC TESTING OF SUBSTRATES	250	TEST, INSP, EVAL
***	PROBLEM	SOLUTION		
***	THICK FILM SUBSTRATES ARE HARD TO TEST BEFORE THE COMPONENTS ARE APPLIED FOR CONTINUITY. IF A BED OF NAILS OR PROBE IS USED IT COULD DAMAGE THE PADS OR CIRCUITRY. IF THE COMPONENTS ARE ATTACHED, THE SUBSTRATE COULD HAVE BEEN DEFECTIVE.	DEVELOP AN ELECTRON BEAM SCANNER THAT WILL INSPECT A THICK FILM SUBSTRATE BY CHARGING EACH THICK FILM CONDUCTOR AND LOOK FOR OPENS AND SHORTS. A COMPUTER WILL DRIVE THE BEAM AND LOOK AT DETECTORS FOR BACKSCATTER. A LIBRARY OF DEFECTS WILL BE DEVELOPED.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	5 82 4237	CONTINUOUS TNT PROCESS ENGINEERING	350	CONTINUOUS FLOW PROCESS
***	PROBLEM	SOLUTION		
***	CURRENT CIL PROCESS REQUIRES PROCESS AND SAFETY IMPROVEMENTS.	DESIGN AND BUILD A CIL LINE TO TEST PROCESS IMPROVEMENTS.		

APPENDICES

APPENDIX A - LATE SUBMITTALS

APPENDIX B - DISTRIBUTION LIST

LATE SUBMITTALS

The project information provided below was submitted late in the programming cycle and is not reflected elsewhere in the report. The US Army Depot System Command is the sponsoring organization.

Project G 81 2001: Provide Prototype Robots for Automated Blast Cleaning

Summary - This effort, programmed for \$133.4K in FY81 and \$283.1K in FY82, will develop technology to apply robots to blast cleaning operations.

Project G 80 4002: Robotized Welding of MM113A2 Suspension

Summary - This effort will be directed toward integrating robot technology into welding operations. Planned funding is FY80 - \$316K and FY81 - \$74K.

Project G 81 4003: Rubber Injection Molding of Double Pin Track

Summary - This effort will develop an automated robot injection molding process for fabrication of rubber track pads. Planned funding is FY81 - \$345K and FY82 - \$118K.

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